REMARKS

Claims 1-18 and 23-30 have been amended, Claims 19-22 have been canceled, and new Claims 33-41 have been added. Thus, claims 1-18 and 23-41 are presented for examination. Claim 1 has been amended to delete reference to "means for" and instead uses the language of "a control system arranged to undertake the means functions". In addition, claim 1 has been amended to include the feature that the transmission system is arranged such that a selection of a new gear ratio takes place almost instantaneously without substantial power interruption.

Support for the claim amendments and new claims may be found in the original claims and throughout the specification. For example, support for new claims 33-35 may be found in the specification at page 5, last three paragraphs. Support for the amendment to claim 23 may be found in the original claim 1, and in the specification at page 5, fifth paragraph. Support for new claim 32 may be found in the specification at page 16, second paragraph; page 18, last paragraph; and page 5, fifth paragraph. Support for new claim 37 may be found in original claims 1 and 2. Support for new claim 38 may be found in the specification at page 1, first and third paragraphs. Support for new claim 39 may be found in the specification at page 5, fifth paragraph, and in original claim 1. Support for new claim 40 may be found in original claim 2. Support for new claim 41 may be found in the specification at page 16, second paragraph; page 18, last paragraph; and page 5, fifth paragraph. Thus, the present amendments do not add new matter and entry thereof is respectfully requested.

Information Disclosure Statement

The Examiner noted that the IDS filed on April 27, 2006, did not contain a legible copy of DE 198 35 334 A. Enclosed herewith is a legible copy of this reference. Applicant respectfully requests that the Examiner consider this reference, and submit a copy of the IDS form submitted on April 27, 2006 with the reference initialed.

Objection to abstract

The Examiner objected to the abstract based on recitation of legal phraseology ("means"). A new abstract, which does not contain any legal phraseology, is enclosed herewith. Thus, reconsideration and withdrawal of the objection are respectfully requested.

Rejections under 35 U.S.C. §112, second paragraph

Claims 1-21 and 23-31 were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite as noted below.

Claim 1 was rejected based on recitation of "a known relationship between the gear ratios" in lines 6-7. One of ordinary skill in the art, upon reading the present specification, will realize that the control system uses knowledge of the gear ratios to control the amount of torque in the transmission system. One explicit example of the type of relationship that might be used, which is a linear relationship wherein the measured deformation values are adjusted by a scaling factor (subject matter of claim 2), has been provided. In addition, the specification on page 2, final paragraph, and page 3, first and second paragraphs, discloses that other relationships may be applicable. For example, in some transmission systems, non-linear relationships may be applicable. Since a known relationship is required in order to obtain the effect of adapting the amount of torque due to the gear being selected, and based on the specific example provided, one of ordinary skill in the art would be able to adapt this knowledge to account for other situations wherein non-linear relationships are applicable. Thus, recitation of this term is not indefinite.

Claim 3 was rejected based on alleged lack of antecedent basis for the term "the rate of change of torque." Claim 3 as amended recites "a rate of change of torque", thus introducing this term for the first time and obviating the need for antecedent basis.

Claim 5 was rejected based on alleged lack of antecedent basis for the term "the speed of a drive source." Claim 5 as amended no longer recites this term, and instead recites "a drive source operating speed."

Claim 6 was rejected based on alleged lack of antecedent basis for the term "the magnitude of torque." Claim 6 as amended recites "a magnitude of torque", thus introducing this term for the first time and obviating the need for antecedent basis.

Claim 8 was rejected based on alleged lack of antecedent basis for the term "the position." Claim 8 as amended recites "operational positions" in place of this term.

Claim 10 was rejected based on alleged lack of antecedent basis for the term "the difference." Claim 10 as amended recites "a difference", thus introducing this term for the first time and obviating the need for antecedent basis.

Claim 12 was rejected based on alleged lack of antecedent basis for the term "the amount of torsional deformation." Claim 12 depends on claim 1 which, as amended, recites the term "arranged to measure the amount of deformation in at least one static component or assembly that is deformed due to torque." It is clear that "deformed due to torque" would result in "torsional deformation." Thus, claim 12 has proper antecedent basis in claim 1.

Claim 13 was rejected based on alleged lack of antecedent basis for the term "the direction of torque." Claim 13 as amended no longer recites this term, and instead recites "in which direction the torque in the transmission is acting.

Claim 17 was rejected based on alleged lack of antecedent basis for the term "the amount of strain in the component." Claim 13 as amended no longer recites this term, and instead recites that the "control system measures strain in the component or assembly."

Claim 19 was rejected based on recitation of "a known relationship between the gear ratios" in line 2. Claim 19 has been canceled, thus rendering this rejection moot. However, as noted above with regard to the same issue in claim 1, recitation of this term is not indefinite.

Claim 20 was rejected based on alleged lack of antecedent basis for the term "the rate of change of torque." Claim 20 has been canceled, thus rendering this rejection moot.

Claim 21 was rejected based on alleged lack of antecedent basis for the term "the amount of torque." Claim 21 has been canceled, thus rendering this rejection moot.

Claim 23 was rejected based on recitation of "a known relationship between the gear ratios" in lines 7-8. Please see comments above regarding the rejection of claim 1.

The Office Action states the since claim 24 is dependent upon itself, that its scope, as well as claims 25-31 which depend on claim 24, have not been considered. Claim 24 as amended depends on claim 23, rather than on itself. In addition, claims 25-31 as amended also depend on claim 23.

Claim 25 was rejected based on alleged lack of antecedent basis for the term "the rate of change of torque." Claim 25 as amended recites "a rate of change of torque", thus introducing this term for the first time and obviating the need for antecedent basis.

Claim 26 was rejected based on alleged lack of antecedent basis for the term "the speed of a drive source." Claim 5 as amended no longer recites this term.

Claim 29 was rejected based on alleged lack of antecedent basis for the term "the amount of torsional deformation." Claim 29 as amended recites "an amount of torsional deformation," thus introducing this term for the first time and obviating the need for antecedent basis.

Claim 30 was rejected based on alleged lack of antecedent basis for the term "the direction of torque." Claim 30 as amended recites "a direction of torque," thus introducing this term for the first time and obviating the need for antecedent basis.

In view of the remarks presented above, Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. §112, second paragraph.

Rejection under 35 U.S.C. § 102(b)

Claims 1-23 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by De Schepper et al. (US 5,767,420).

Claims 1-18

Claim 1 as amended recites that the control system is arranged to measure deformation in at least one static component or assembly that is deformed due to torque in a transmission system, that torque in the transmission system is controlled in accordance with the measured deformation and a known relationship between the gear ratios, and that the transmission system is arranged such that selection of a new gear ratio takes place almost instantaneously without substantial power interruption.

In contrast, in all three embodiments of De Schepper, the deformation is measured in components that are arranged to rotate, i.e. they are not static. For example, the first embodiment shown in Figure 1 includes a first rotary member 11 that is connected to an input shaft 1, and a second rotary member 21 that is connected to an output shaft 2, wherein the first and second rotary members are connected to each other by elastic elements 3. The input shaft, output shaft, first and second rotary members, and the elastic elements are all arranged to rotate (i.e., are not static), with deformation being measured by a sensor 4 and torque computing means 5, which determines the rotational phase difference detected between the first and second rotary members 11 (see column 2, lines 45-67).

Also, nowhere does De Schepper teach or suggest that the torque in the transmission system is controlled in accordance with the measured deformation and a known relationship between the gear ratios. At column 7, lines 13-25, De Schepper teaches that clutch pressure can be controlled according to "the basis of the torque." However, there is no mention of a known relationship between the gear ratios. At column 7, lines 20-25, De Schepper teaches that it is possible to identify which gear has been selected by a comparison of the input and output rpm. However, this references does not explaining how this information can be used to control the amount of torque in the transmission system.

Furthermore, it is clear from column 5, line 35 of De Schepper, that the system disclosed is applied to conventional automatic transmission systems (see Figure 10). Conventional

automatic transmission systems are not arranged to select new gear ratios almost instantaneously without substantial power interruption. Instantaneous transmission systems select a new gear ratio while the current gear ratio is still engaged. Automatic transmission systems cannot do this.

In addition, none of the other prior art documents made of record and not relied upon by the Examiner disclose or suggest the above features.

In addition, claim 1 is not obvious in view of De Schepper. Claim 1 relates to instantaneous transmission systems and recites that torque is determined by measuring the deformation of a static component or assembly and that the measured deformation and a known relationship between the gears is used to control torque in the transmission system. The combination of these features provides unexpected advantages that are neither disclosed nor suggested by the cited reference, namely a better control system to solve a problem with instantaneous transmission systems that is not applicable to other types of transmission systems.

Very large torque spikes are generated when engaging a new gear because in instantaneous transmission systems a new gear is selected under power while the current gear is still engaged (see present specification at page 1, third paragraph). Neither De Schepper, nor any of the other noted prior art made of record and not relied upon, recognizes the problem associated with torque spikes when shifting between gear ratios in instantaneous transmission systems. Furthermore, in order to mitigate this problem the control system controls the torque in the transmission system according to the amount of deformation measured in a static component, which contrasts with the rotary arrangement in De Schepper, and a known relationship between the gear ratios. Using a known relationship between the gear ratios enables the control system to produce smoother gear changes without having to calculate the absolute value of torque in the transmission system. This is not disclosed in any of the cited references. Furthermore, measuring deformation in a static component increases the reliability of the measurements since pickup sensors can easily become soiled during use, which can affect the readings.

Claims 2-18 are all dependent on Claim 1, and are patentable for the same reasons as Claim 1, as well as based on the various features recited in these claims.

Claims 19-22

Claims 19-22 have been canceled, and the rejection is moot as applied to those claims.

Claim 23

Claim 23 as amended relates to a method for changing gear ratios in a transmission system having a structure that enables it to perform instantaneous shifts in addition to the control aspects of claim 1. New claim 23 is further distinguished from De Schepper in that it includes first and second gear ratios that transfer drive between the first and second shafts, wherein the first and second gear wheels are rotatably mounted on the first shaft (this differs from the planetary gear system of De Schepper - see column 5, lines 35-40), and it includes a selector assembly that includes first and second sets of engagement members that are moveable into and out of engagement with the first and second gear wheels independently of each other, said selector assembly being arranged such that when a driving force is transmitted, one of the first and second sets of engagement members drivingly engages an engaged gear wheel, and the other set of engagement members is then in an unloaded condition, wherein the actuator assembly is arranged to move the unloaded set of engagement members to effect a gear change, said method including measuring the deformation caused by torque in the at least one static component or assembly, selecting an unengaged gear ratio, and adjusting the torque in the transmission system in accordance with the measured deformation and a known relationship between the gear ratios. In contrast, De Schepper uses brakes and clutches in order to select between gear ratios (see column 5, line 43 to column 6 line 26).

Since claim 23 includes a transmission system structure that enables instantaneous gear shifts to take place and includes the control features of claim 1, which is both novel and nonobvious in view of the cite references, then claim 23 is also novel and nonobvious.

In view of the foregoing, withdrawal of the rejection over the De Schepper et al. reference is respectfully requested.

Patentability of Remaining Claims

As discussed below, all of the remaining claims in the application are also patentable over the De Schepper et al. reference.

Claims 24-36

Claims 24-26 are all dependent on either Claims 1 or 23 and are patentable for the same reasons as those claims, and also in view of the various features recited in those claims.

Claims 37-38

New claims 37 and 38 differs from De Schepper, at least in that deformation is measured in a static component or assembly, and also that torque in a transmission system is controlled according to a known relationship between the gear ratios wherein the known relationship is substantially linear and values corresponding to the measured deformation are adjusted by a scaling factor. US 5,767,420 does not disclose adjusting torque in a transmission based on the known relationship between the gear ratios and therefore does not disclose adjusting the measured values by a scaling factor. Using a known relationship between the gear ratios enables the control system to produce smoother gear changes without having to calculate the absolute value of torque in the transmission system. This provides a better control system, which is an unexpected advantage that could not have been predicted based upon De Schepper.

Claims 39-41

New claim 39, and its dependent claims 40-41, relate to a transmission system that is similarly arranged to the transmission system of claim 23. Accordingly, the arguments applicable to claim 23 are also applicable to claims 39-41.

CONCLUSION

In view of the foregoing, Applicant submits that all claims are in condition for allowance. However, if minor matters remain, the Examiner is invited to contact the undersigned at the telephone number provided below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 12/2/08

By: _____

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